

DE1 **ADVANCED HORIZONTAL & MULTILATERAL WELL DRILLING TECHNOLOGY**



COURSE AIMS

To familiarise students with the reasons for drilling extended reach and horizontal wells and the implications on economics, formation evaluation, production and safety.

They will learn about well planning and design and the special considerations of horizontal wells for casing, drilling and completion fluids, hole cleaning and stuck pipe problems. Special emphasis is placed on well design, steerable drilling tools, formation evaluation and geosteering techniques.

WHO SHOULD ATTEND

Directional Drillers, Drilling Engineers, Wellsite Geologists, Operations Geologists, Development and Exploration Geologists, Petroleum Engineers, MWD Operators, Senior Mudlogging Operators.

COURSE CONTENT

Well Planning and Candidate Selection

- Well Planning Process
- Risk Management Contingencies
- Reasons for Horizontal Drilling
- Candidate Screening

- o Steerable Rotary Drilling Tools
- Rock mechanics and Borehole Stability
- Hole Cleaning and Hydraulics
- Survey Tools & Techniques
- Survey Calculations
 - o Straight Line
 - o Minimum Curvature
 - o Ellipse of Uncertainty

Directional Drilling

- Definitions & Applications
 - o Well Planning
 - o Borehole Geometry
 - o Co-ordinate Systems
- Kick-off Techniques
 - o Casing Whipstocks
 - o Mud Motors/bent subs
- Steerable Drilling Systems
 - o Rotary Drilling Techniques

Horizontal & Multi-Lateral Drilling

- **Definitions & Applications**
 - o Well Planning
 - o Long Radius
 - o Medium Radius
 - o Short Radius
- **Drilling Fluids**
- **Stuck Pipe**

- **Drilling Tools**
 - Articulated Motors
 - Dual Adjustable KO subs
 - Rotary Drilling Systems
- **Coiled Tubing Operations**
 - Materials
 - Failure Prevention
 - Hydraulics
 - Motors and Bits
 - Formation Evaluation
 - Limitations
- **Underbalanced Drilling**
 - Applications
 - Selection
 - Well Planning
 - Safety Case and HAZOP
 - Pneumatic Fluids
 - Aerated Fluids
- **Multi-Lateral Drilling**
 - Definitions & Applications
 - Candidate Selection
 - Technology Development/Systems Overview
 - Aerated Fluids
- **Multi-Lateral Drilling**
 - Definitions & Applications
 - Candidate Selection
 - Technology Development/Systems Overview
 - Open Hole Sidetracks
 - Level 1-6 Technologies
- **Completions Technology**
 - Zone isolation
 - Stimulation
 - Artificial Lift
- **Formation Evaluation**
 - Mudlogging/Wellsite Geology.
- **MWD**
 - Multiple Wave Propagation
 - Azimuthal Density/Neutron Tools
 - At Bit Inclination
 - Borehole Imaging Tools
- **Geosteering techniques**
 - Data Integration
 - Co-ordination
 - Monitoring
- **Case Studies**

**THE LECTURER
ONE OF PETRO-TEC CONSULTANTS**